



X80 Echo

User's Manual

Version 1.0

www.buckeyecam.com

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1. Warnings

1. Warnings



Contains FCC ID:MCQ-XBEE09P The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.



If the device is used with any antenna other than the one supplied, the system may not comply with the FCC regulation Part 15.247, Operation within the license-free band 902 – 928 MHz. Contact the manufacturer regarding use of optional high-gain antennas.



WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance are not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

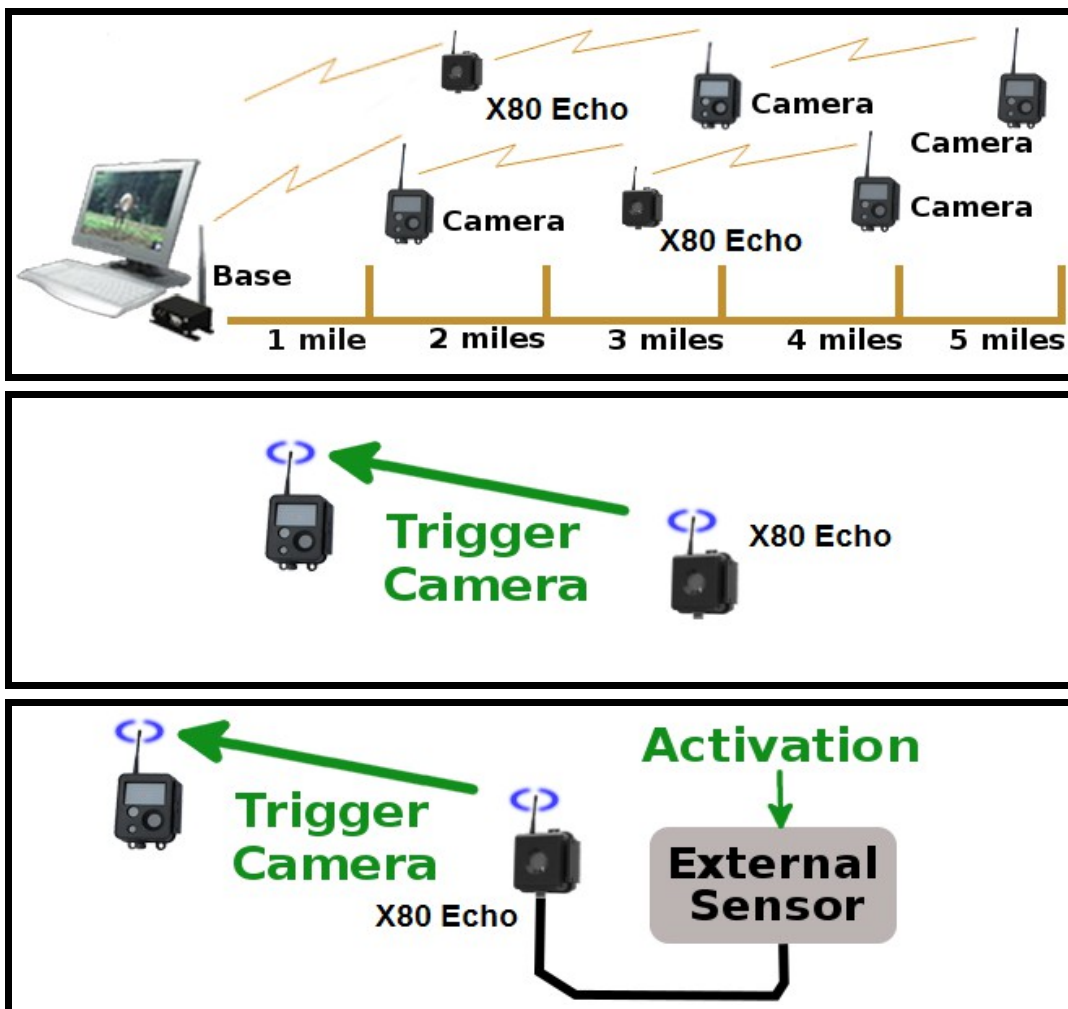
2. Overview

2. Overview

The Buckeye Cam X80 Series includes wireless cameras, sensors, repeaters, and actuators. All of the available devices work seamlessly together and may be controlled and monitored with the *X-Series Network Manager* software application. Before using the *X80 Echo*, it is important to be familiar with *X-Series Network Manager*. User's manuals and video tutorials may be found at www.buckeyecam.com/site/support.html.

The *X80 Echo* combines a passive infrared motion detector (PIR), a contact closure input, and an RF repeater in a single device. When added to an X80 wireless network, it can be used for any of the following functions:

- Extending the transmission range of wireless cameras
- Extending the motion detection range of wireless cameras
- Triggering multiple wireless cameras from one motion sensor
- Triggering a single wireless camera from multiple motion sensors
- Interfacing with other sensor types (i.e. seismic, magnetometer, pressure pad, etc.)

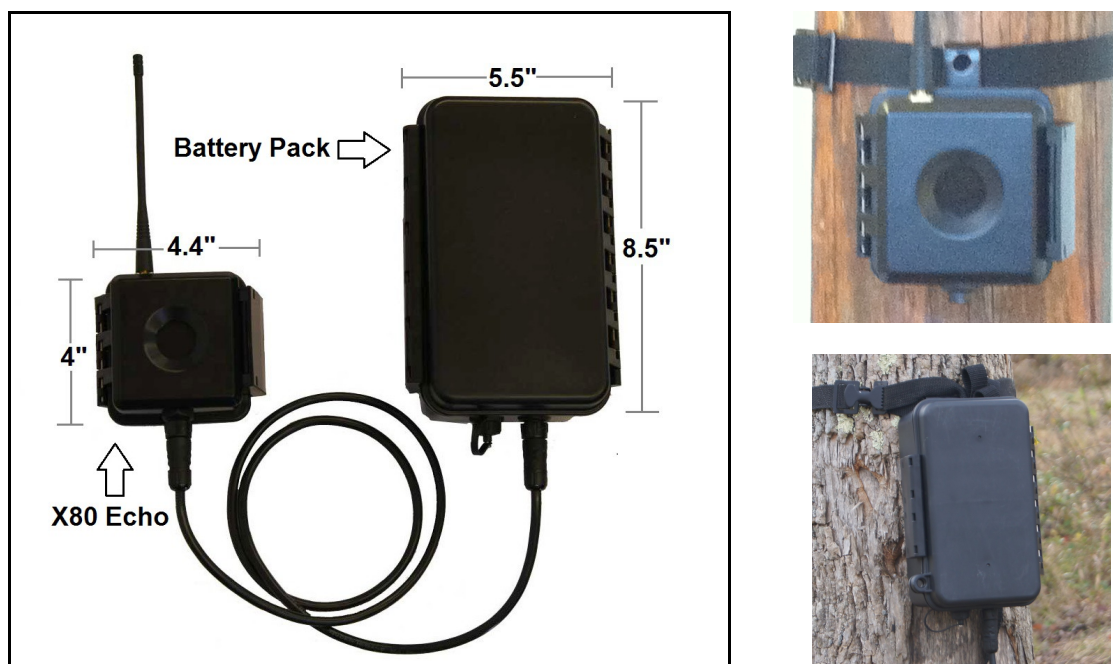


3. Specifications

3. Specifications

The *X80 Echo* and battery pack are housed in watertight, weatherproof enclosures for reliable outdoor operation. The standard color is matte black. Optional camo finishes are available in both woodland and desert patterns.

A bracket and spring buckle strap attach to the back of the enclosures to allow for easy mounting. The 12V SLA battery pack (if used) may be placed on the ground or attached using the spring buckle strap.



There are two battery power options available :

1. 5 internal AA batteries.
2. External battery pack with UB1270 12V battery.



NOTE: When using the repeater function, the 12V external battery pack is required for the Echo (see "Specifications").

If the repeater function is not used, either the internal AA batteries, external battery pack, or both may be used.

3. Specifications

Performance Features	
Functions	Motion Sensor, RF Repeater, Auxiliary Sensor Interface
Auxiliary Input	Connect to battery (-) to activate. Max. current = 10mA
Compatibility	All X80 Wireless Devices, X-Series Network Manager
Operating Temperature	-40 to 140 F
Motion Detection	
Type	Passive Infrared (PIR)
Range ²	User adjustable. Up to 100 feet
Angle	Approximately 10 degrees
Reaction Time ³	0.1 Seconds
Delay between activations	User selectable. 1 second to 2 hours.
Data transmitted with each activation	Date, Time, custom text field
Wireless Network	
Maximum number of network devices	254 (total of all device types)
Line-of-sight transmission Range ⁴	Up to 2 miles with standard antennas
Maximum allowable antenna gain	15.1 dBi (including cable losses)
Transmission type	902 to 928 MHz frequency band, FHSS
Transmitter Output Power	Up to 250 mW
Agency Approvals	
FCC (USA)	MCQ-XB900HP
IC (Canada)	1846A-XB900HP
C-Tick (Australia)	Yes
Anatel (Brazil)	Pending
Power Requirements	
Internal Battery ⁵	5 internal AA. For best performance use Lithium type.
External Battery (Optional) ⁵	External 12V SLA UB1270, required for repeater function
Solar Panel	Optional solar panels sold separately
Dimensions	
X80 Echo	4L x 4.4W x 2.75D (Dimensions are in inches)
External Battery Pack	8.5L x 5.5W x 3.75D (Dimensions are in inches)

¹ Specifications are subject to change and may not be available in all firmware or software versions. Check www.buckeyecam.com for the latest firmware and software updates.

² Motion detector range may be affected by mounting angle and ambient temperature.

³ Reaction time specification is for motion detection only. It does not include transmission delays and delays associated with triggering other devices.

⁴ Transmission range will depend on the type of antennas that are used, the surrounding terrain and the amount of interference received.

⁵ Batteries are sold separately

4. Getting Started

4. Getting Started

1

Install 5 AA batteries.

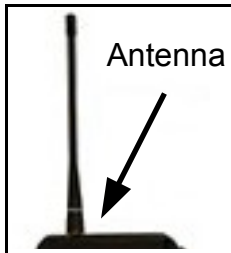
Remove the battery cover and install 5 AA batteries as shown. Replace the battery cover. **Note:** The AA batteries are optional if the external battery pack is used.



2

Attach antenna.

Screw the antenna onto the threaded antenna connector. Do not overtighten.



3

Install a UB1270 battery into the battery pack.

Connect the red wire to the (+) battery terminal and the black wire to the (-) .

Note: If you are not using the battery pack, you may skip to step 5.



4

Connect to the battery pack to the X80 Echo.

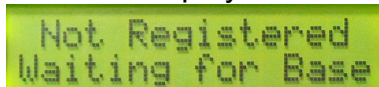
Using the supplied cable, connect the battery pack to the Echo.



5

Open the X80 Echo enclosure.

The LCD display should read "Not Registered Waiting for Base".



4. Getting Started

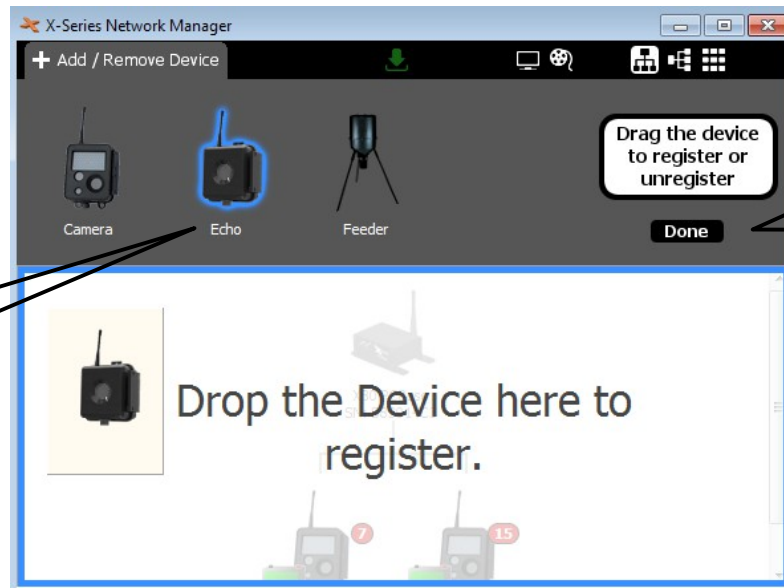
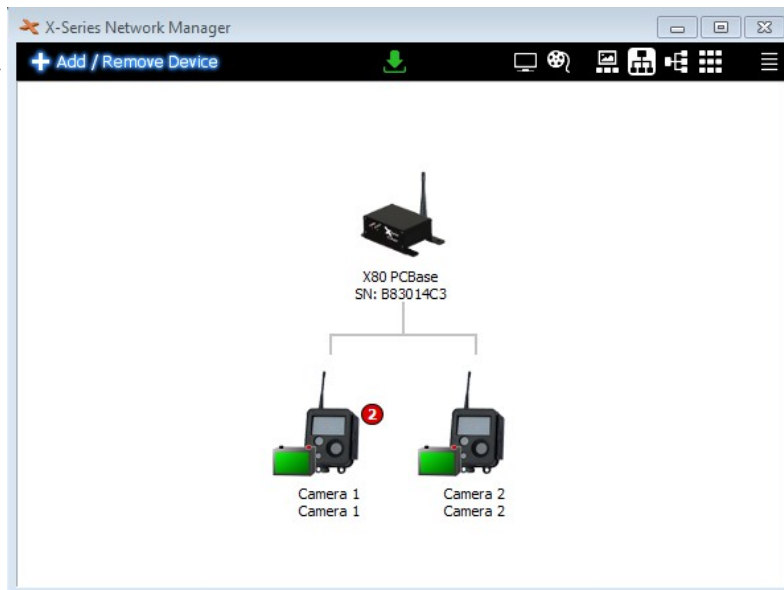
6

Add to X-Series Network Manager

From *X-Series Network Manager*, click on “Add/Remove Device”. Click on the *Echo* icon and drag it into the network view.

Note: X-Series Network Manager must already be installed and connected to a base. Refer to the *X-Series Network Manager User's Manual* or the video tutorials at www.buckeyecam.com for instructions on how to do this.

Click here



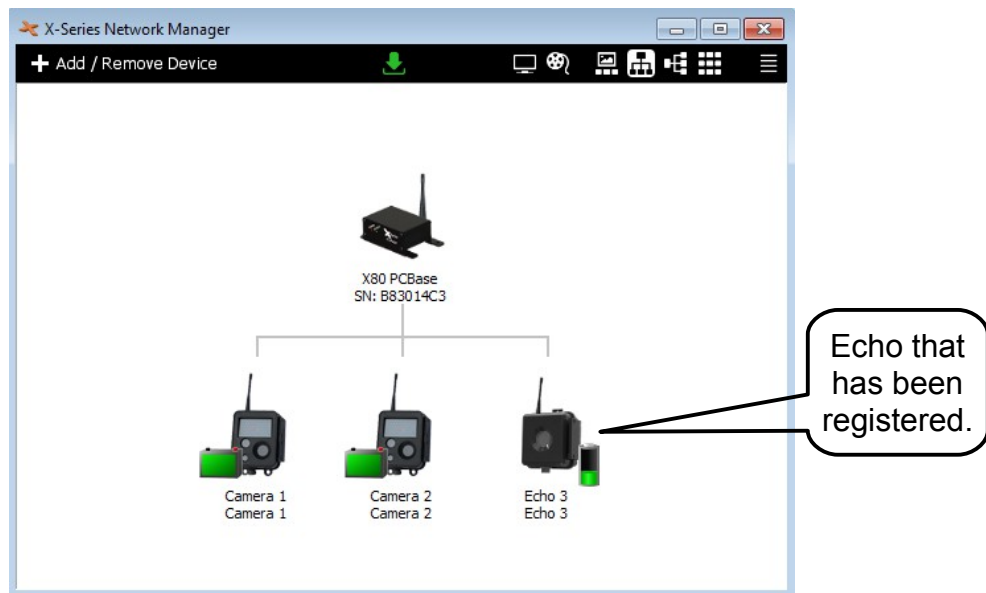
Click on Echo. Drag and drop.

Repeat steps 1–6 for all of the Echos that you have.
Click Done when finished.

5. Echo Control Panel

5. Echo Control Panel

Once an *Echo* has been registered to a base using *X-Series Network Manager* (see “Getting Started”), it will appear on the network view.



To access the *Echo* control panel, click on the *Echo* icon. Click on the command buttons to execute commands as shown below. To close the Echo control panel, click “Done” or click on another device in the network view.

The screenshot shows the X-Series Network Manager interface with the 'Echo 3 Control Panel' open. The panel is divided into three main sections: 'Trigger Events', 'Commands', and 'Status / Information'. The 'Echo 3' icon in the network view is highlighted with a blue glow and a red '5' in a circle. Callouts point to various elements in the control panel:

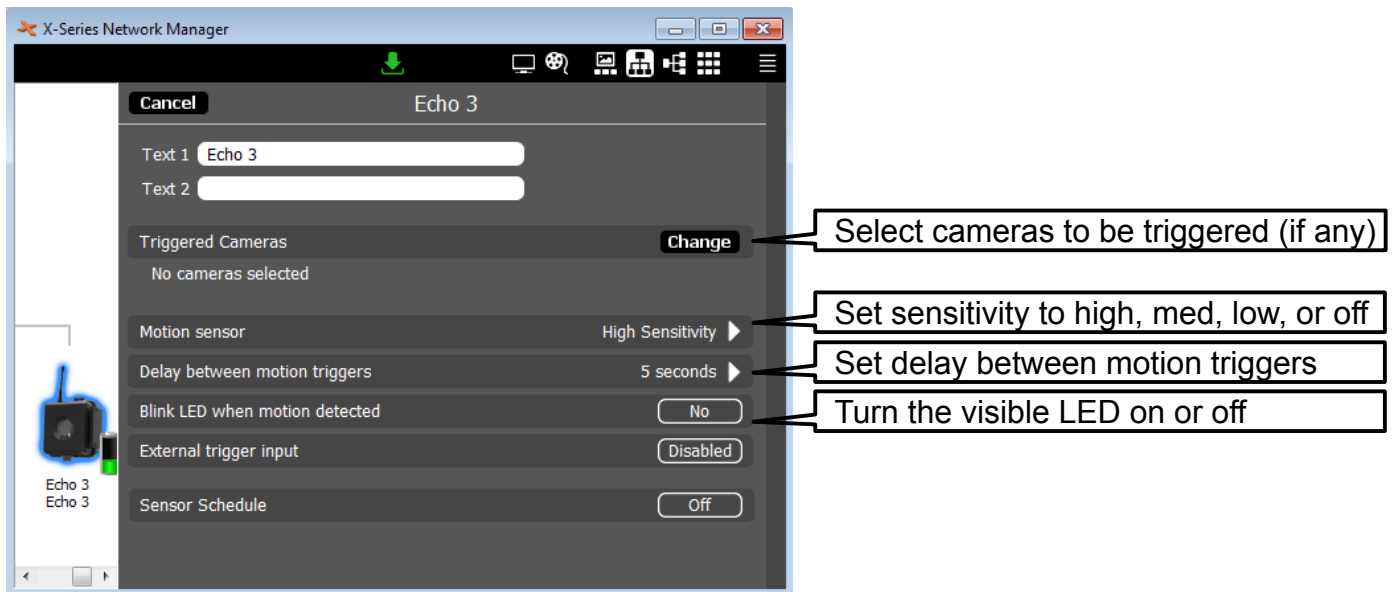
- Trigger Events:** A list of PIR events with timestamps. A callout points to the list with the text 'Date and time of last six triggers'. Below the list is a 'More...' button.
- Commands:** A list of buttons: 'Check Status', 'Manual Trigger', 'Disable Sensor', 'Enable Sensor', and 'Settings'. Callouts point to each button with the following text:
 - 'Check Status': Check battery and signal level
 - 'Manual Trigger': Manually trigger the Echo
 - 'Disable Sensor': Temporarily disable motion sensor
 - 'Enable Sensor': Force motion sensor to enable
 - 'Settings': Change the Echo settings
- Status / Information:** A section showing device status: 'External Battery: not connected', '5xAA Battery: 34%', 'Motion Sensor: Enabled', 'Total Triggered: 1', 'Serial Number: 12345678', and 'Firmware Version: v.1.1.0'. A 'Reset' button is located next to 'Total Triggered: 1'.

6. Motion Sensor Settings

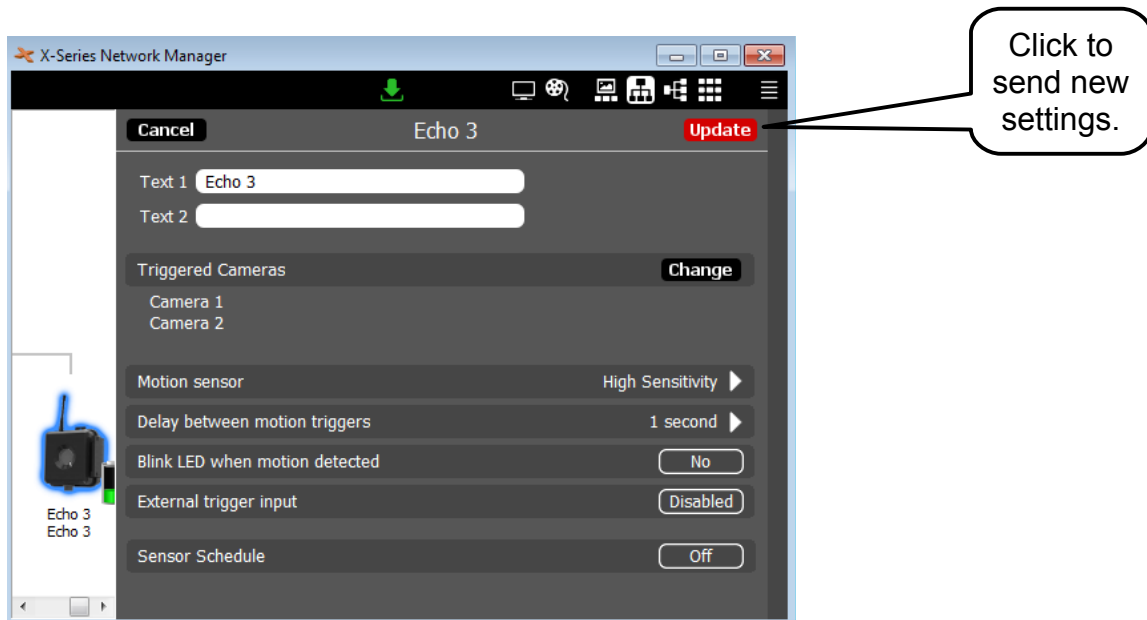
6. Motion Sensor Settings

To change the motion sensor settings, click on the *Echo* icon to open the control panel and then click the “Settings” button (see “Echo Control Panel”).

The Echo can be set to trigger other cameras when its own motion sensor is triggered.



If the settings are changed, a red “Update” button will appear in the top right corner of the window. Click this button to send the new settings to the *Echo*.



7. Display and Pushbuttons

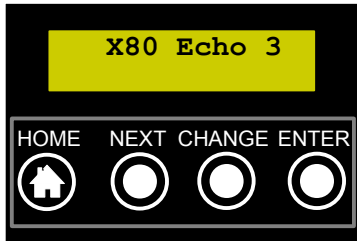
7. Display and Pushbuttons

To access the LCD display and pushbuttons, release the latch and open the *Echo* enclosure.

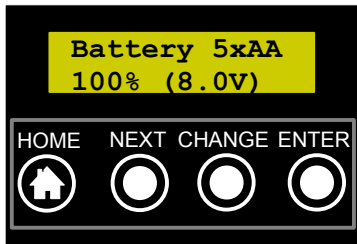
If no buttons have been pushed for some period of time, the LCD display will go blank in order to save battery power. Pushing any button will wake it up.

Pushing the NEXT button will always advance the display to show the next message.

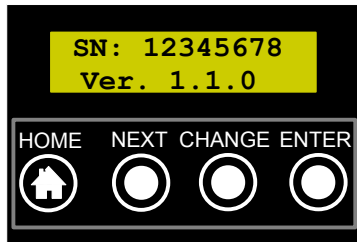
Pushing the HOME button will always return the display sequence to the first message.



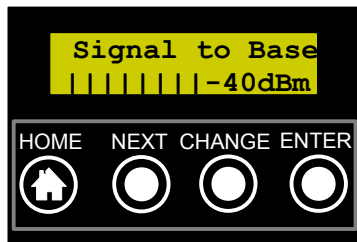
The first message shows the device number (i.e. Echo 1, Echo 2, etc..)



The next message shows the battery voltage. If both types of batteries are in use (i.e. AA and 12V external), push the change button to toggle the reading between both types.

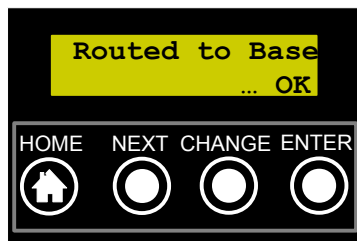


The next message shows the Echo serial number and firmware version.



The next message shows the signal to the base. The signal is shown in dBm and also “bars”. The maximum number of bars is 8.

If the Echo cannot get a signal to the base, you may considering trying to route it through a repeater (see “Setting up a Repeater”).



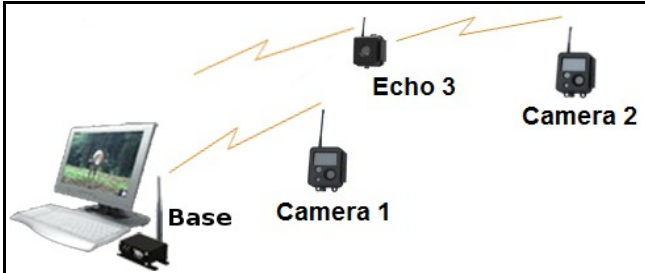
The last message shows how the Echo is routed. The default is “Base”. This indicates that the Echo will be transmitting directly to the base.

If you need to change the routing see “Setting up a Repeater”.

8. Setting up a Repeater

8. Setting up a Repeater

One method to extend transmission distance is to use repeaters. Every X80 wireless device may be used as a repeater (i.e. cameras, feeder controllers, Echo, etc.). To setup an *Echo* as a repeater, it must first be registered to a base using *X-Series Network Manager* software (see “Getting Started”). In the following example, an *Echo* will be setup as a repeater for a camera. In other words, a camera will be “routed through” an *Echo*.



In this example, Camera 2 cannot establish a signal to the base due to a very long distance, or obstructions.

Echo 3 is placed somewhere between Camera 2 and the base where it is able to get a good signal to both the camera AND the base.

Routed to Base
... OK



Setting up a camera to route through an *Echo* is done at the camera.

Open the camera enclosure and push the NEXT button until the display shows how the camera is currently routed.

Routed to Base
Searching...



To change the routing, push the CHANGE button. The camera will now search for any devices that it can get a signal from.

3 nodes found
NEXT-view list



When the search is complete, the display will show the number of nodes found (if any). Push the NEXT button to view each node on the list.

Change to Node3
Echo 3



When the display shows the node that you would like to route through, push the ENTER button.

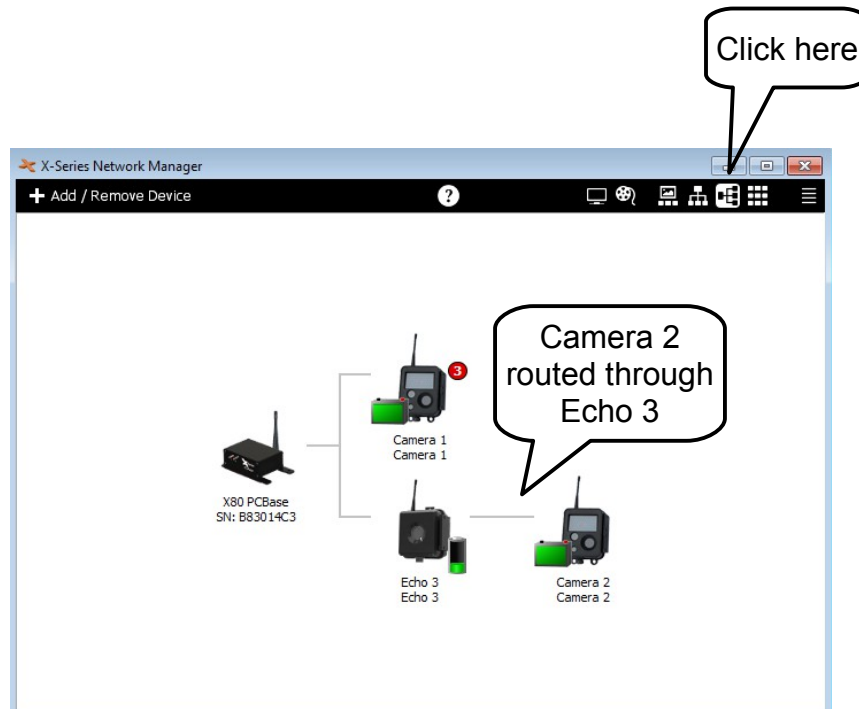
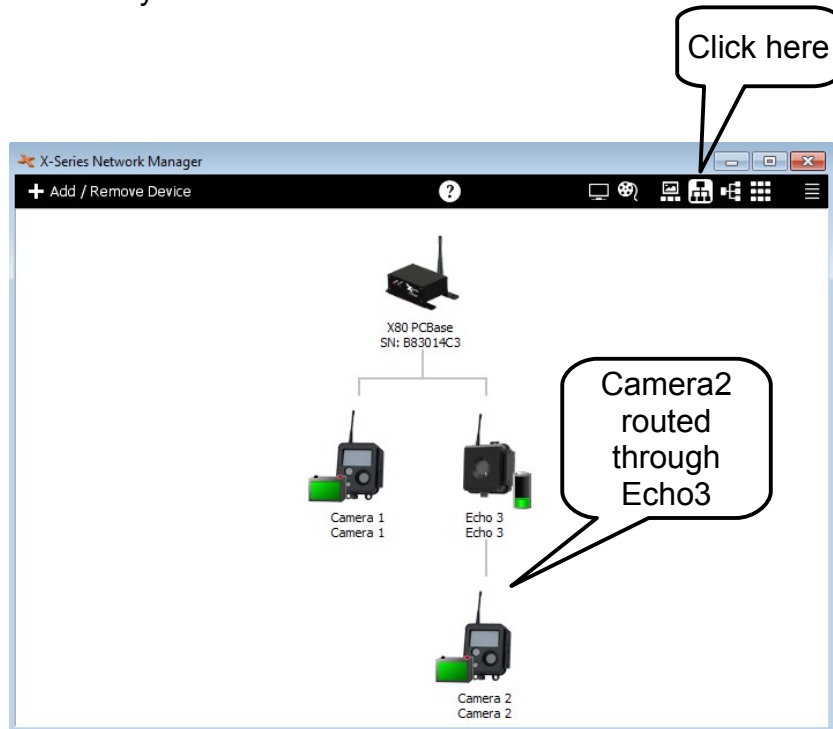
Routed to Node3
... OK



Now the camera will try to contact the base through the node that you have selected. If it is successful, the display will show “...OK”.

8. Setting up a Repeater

In *X-Series Network Manager*, click on one of the network tree view icons to see a visual representation of the network routing. The examples below show Camera 2 routed through Echo 3. Camera 1 is routed directly to the base.

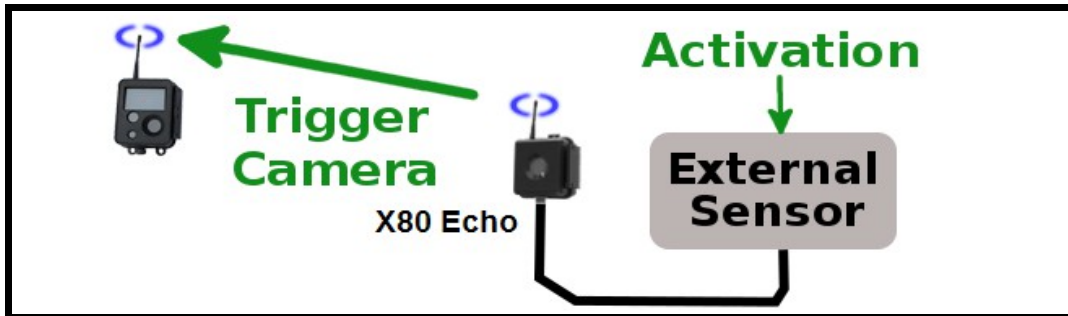


NOTE: When using the repeater function, the 12V external battery pack is required for the Echo (see “Specifications”).

9. Connecting to an External Sensor

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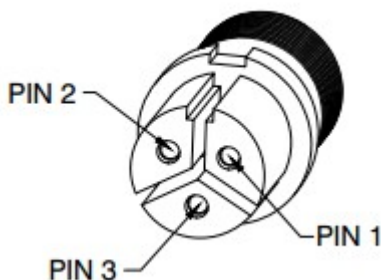
The *X80 Echo* can connect to an external sensor that has a contact closure output. This feature allows a camera to be triggered by various types of sensors in addition to the motion detector (i.e. seismic, magnetometer, pressure pad, etc.).



NOTE: The “Echo to External Sensor Connector Kit” shown below (sold separately) is required to connect to an external sensor.



The “Echo to External Sensor Connector Kit” (sold separately) is required to connect to an external sensor. This kit includes a 9 foot cable with an *X80 Echo* connector on one end, and open wires on the other end. The kit also includes an extra X80 connector. The wiring is shown below:



Pin	Wire Color	Function
1	Brown	Input (1K pull up to battery voltage)
2	Blue	Not used
3	Green/Yellow	Ground

To trigger the *Echo*, the external sensor must be wired so that it closes the connection between Pins 1 and 3 when it is activated (Brown and Green/Yellow).

NOTE: The external sensor must provide a “dry contact” type output. Do not connect any voltage to the *Echo* pins.

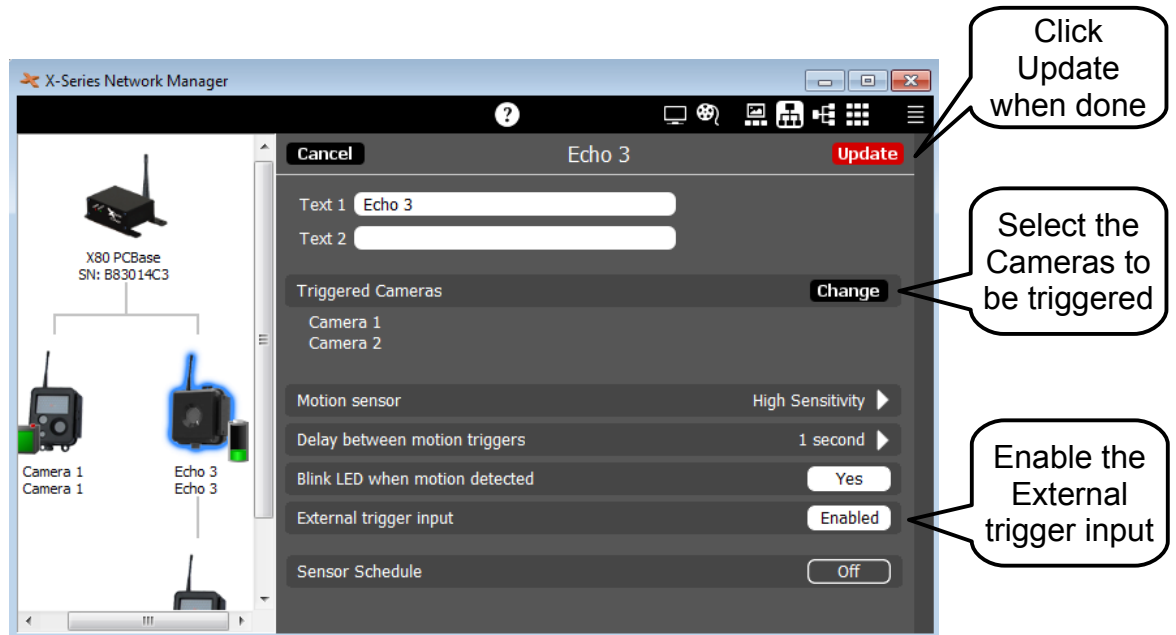
9. Connecting to an External Sensor

Once the Echo has been connected to an external sensor, the *External trigger input* must be enabled from *X-Series Network Manager*. To enable the *External trigger input*, click on the *Echo* icon to open the control panel and then click the “Settings” button (see “Echo Control Panel”).

Click *Edit* or *Change* to select the cameras that should be triggered.

Click the toggle button so that *External trigger input* is *Enabled*.

Click the red *Update* button to send the new settings to the *Echo*.



When the *External trigger input* is enabled, the Echo's own motion sensor may still be enabled if desired. If it is enabled, the *Echo* will trigger the camera when either the *External trigger input* or the motion sensor is active.

If you do not want to use the *Echo* motion sensor, it may be set to “off”.

10. Warranty and Service

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For service or repair, contact ATSI/Buckeye Cam at:

ATSI

8157 US Hwy 50 • Athens, OH 45701

(866) 325-8172 • (740) 592-2874

Fax (740) 594-2875

www.buckeyecam.com

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